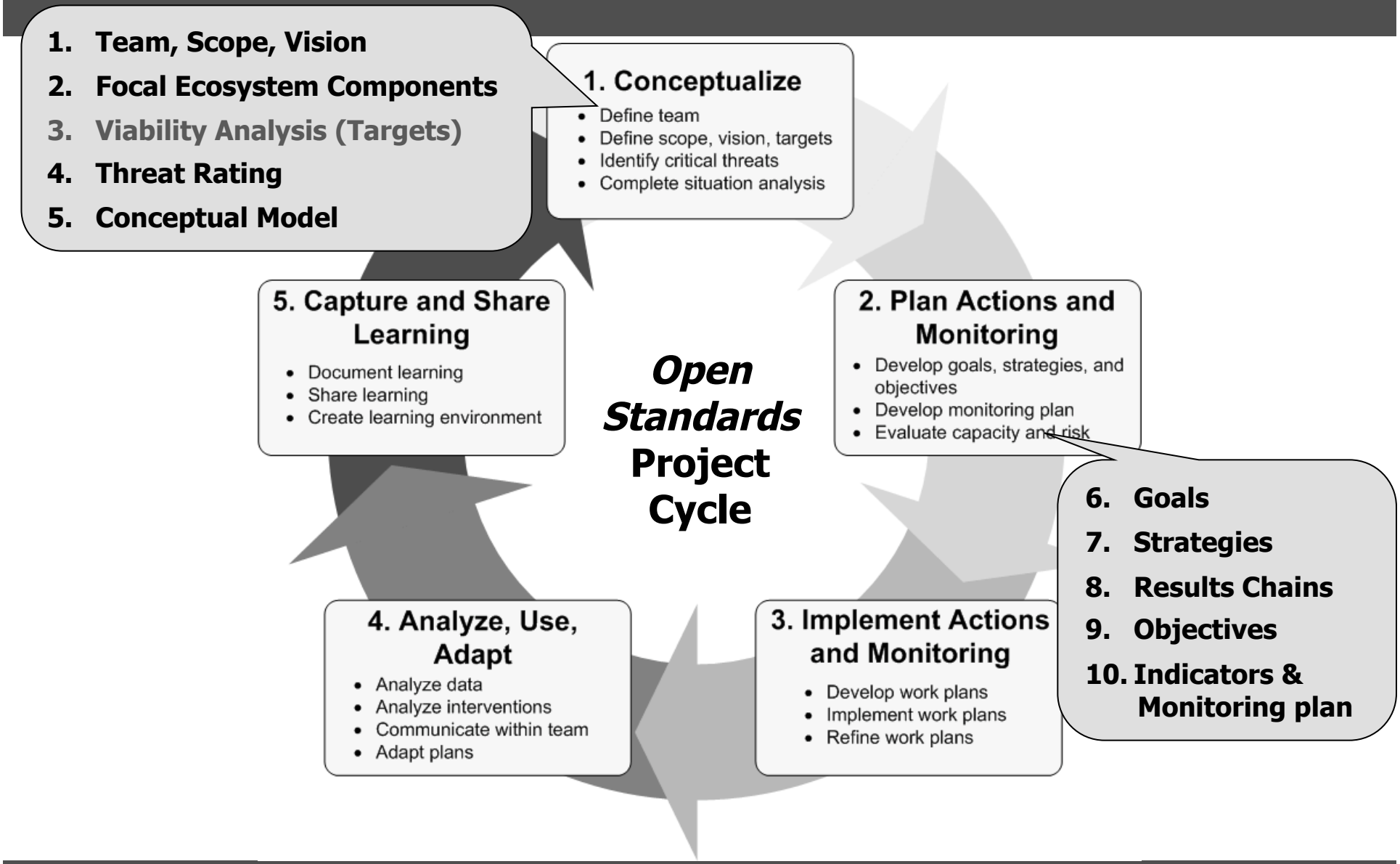
How Does the Science Panel Want To Be Involved in Target Setting?

- Review Open Standards Approach
  - Reasonable First Approach?
  - How Can It Be Improved?
- Review Partnership Target Setting Process
  - First Suite of "No Regrets" Targets - Eelgrass, Estuary Restoration, Shellfish Beds
  - Next Steps

Strategic Planning Process

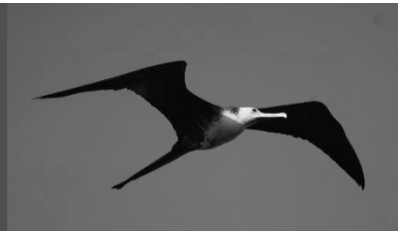


Why Is Viability Analysis Important?

Viability assessment helps:

- Define the most important ecological requirements of focal ecosystem components
- Identify the current status of focal ecosystem components
- Set appropriate, measurable goals for desired future conditions of focal ecosystem components
- Guide monitoring plans

Viability Analysis: The Basics



Focal Ecosystem Components

- Limited suite of species, ecological communities and ecological systems chosen to represent and encompass conservation goals
- “Nouns”
- Framework described in Puget Sound Science Update

Viability Analysis: The Basics

1. Define indicators for focal ecosystem components related to size, condition, and/or landscape context

2. Specify a range of variation for each indicator, using the categories of **Very Good, Good, Fair,** or **Poor**

3. State what the status is now and where we want it to be

Viability Analysis: The Details

1) **Define "key ecological attributes" (KEAs) for focal ecosystem components**

KEA: Aspects of a focal ecosystem component's biology or ecology that

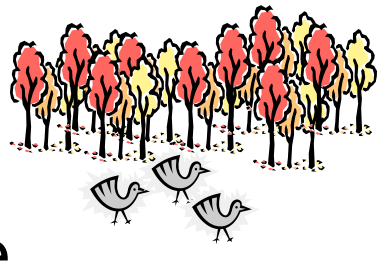
- If present, define a healthy component
- If missing or altered, would lead to the loss or extreme degradation of that component over time.

Examples:

- Tropical hardwood forest: size, connectivity among systems, presence of key species
- Pacific Salmon: population abundance and growth rate, diversity, and spatial structure

Viability Analysis: The Details

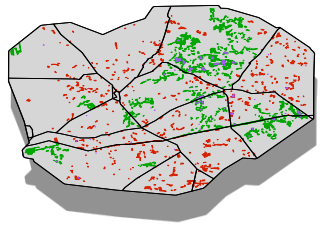
1) **Define "key ecological attributes" of your focal ecosystem component**



Consider the following categories:

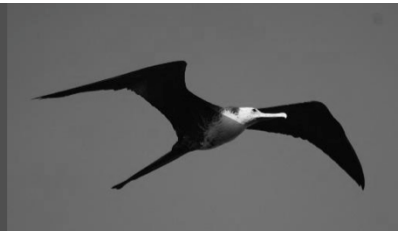
Size – Geographic extent (ecosystem or habitat); Abundance &/or demographics of the population/community (species)

Condition – Composition, structure, & biotic interactions



Landscape Context – Landscape-scale ecological processes, adjacency and connectivity

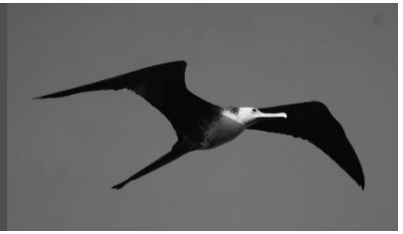
Viability Analysis: An Example



1) **Define "key ecological attributes" of your target.**

Target	Category	KEA
Seabirds	Size	Population size of frigatebirds

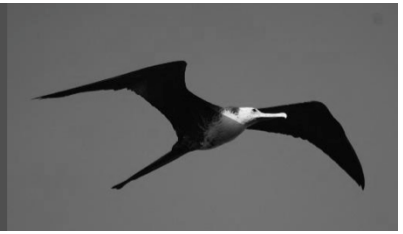
Viability Analysis: An Example



2) Identify an indicator(s) for your KEA and specify a range of variation for each indicator, using the categories of **Very Good, Good, Fair,** or **Poor**.

Target	Category	KEA	Indicator
Seabirds	Size	Population size of frigatebirds	Breeding pairs of frigatebirds

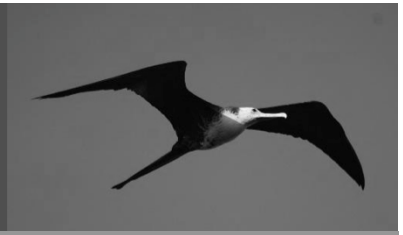
Viability Analysis: An Example



2) Identify an indicator(s) for your KEA and specify a range of variation for each indicator, using the categories of Very Good, Good, Fair, or Poor.

				Indicator Ratings			
Target	**Category**	**KEA**	**Indicator**	**Poor**	**Fair**	**Good**	**Very Good**
Seabirds	Size	Population size of frigatebirds	Breeding pairs of frigatebirds				

Viability Analysis: An Example

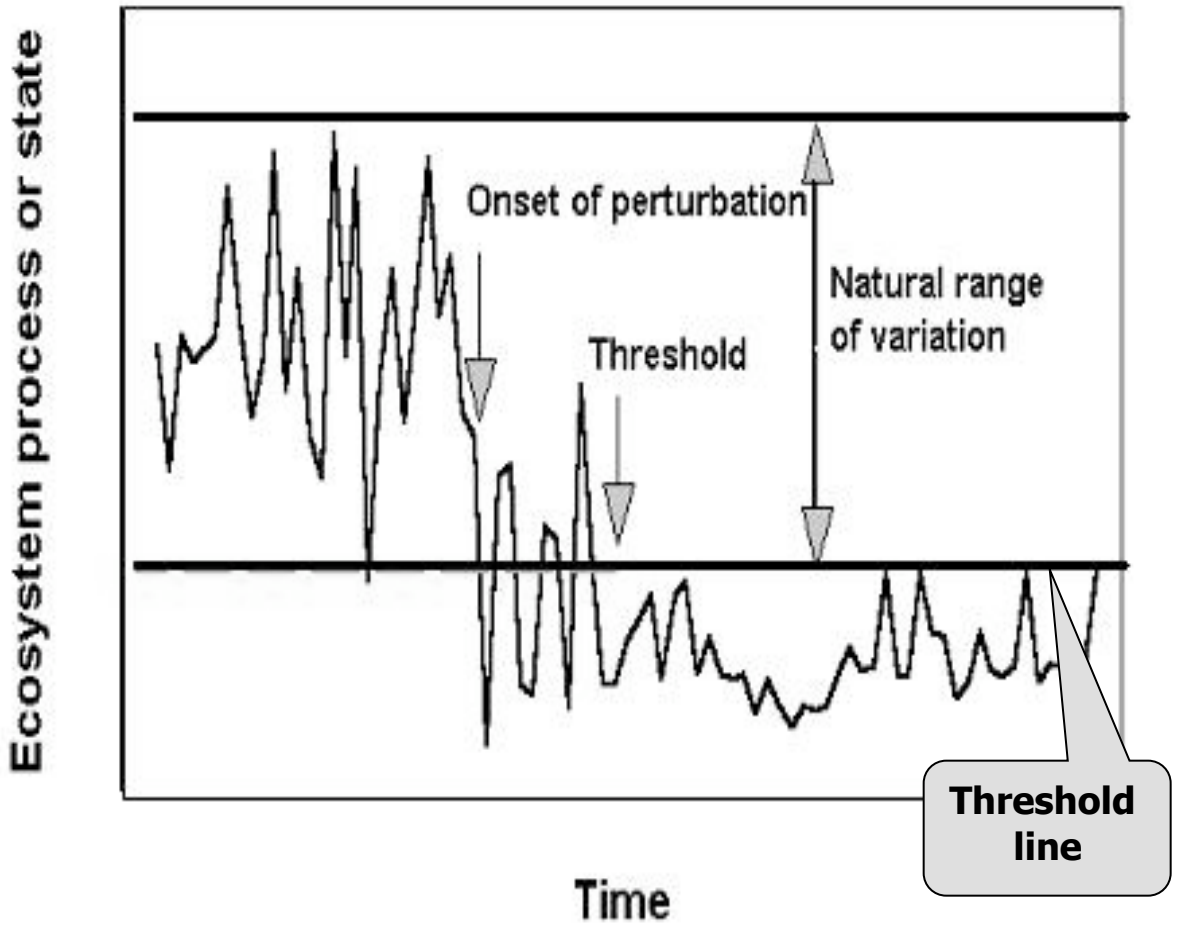


Poor:	**Fair:**	**Good:**	**Very Good:**
Restoration increasingly difficult; May result in extirpation	Outside acceptable range of variation; Requires human intervention	Indicator w/in acceptable range of variation; Some intervention required for maintenance	Ecologically desirable status; Requires little intervention for maintenance

				Indicator Ratings			
Target	**Category**	**KEA**	**Indicator**	**Poor**	**Fair**	**Good**	**Very Good**
Seabirds	Size	Population size of frigatebirds	Breeding pairs of frigatebirds				

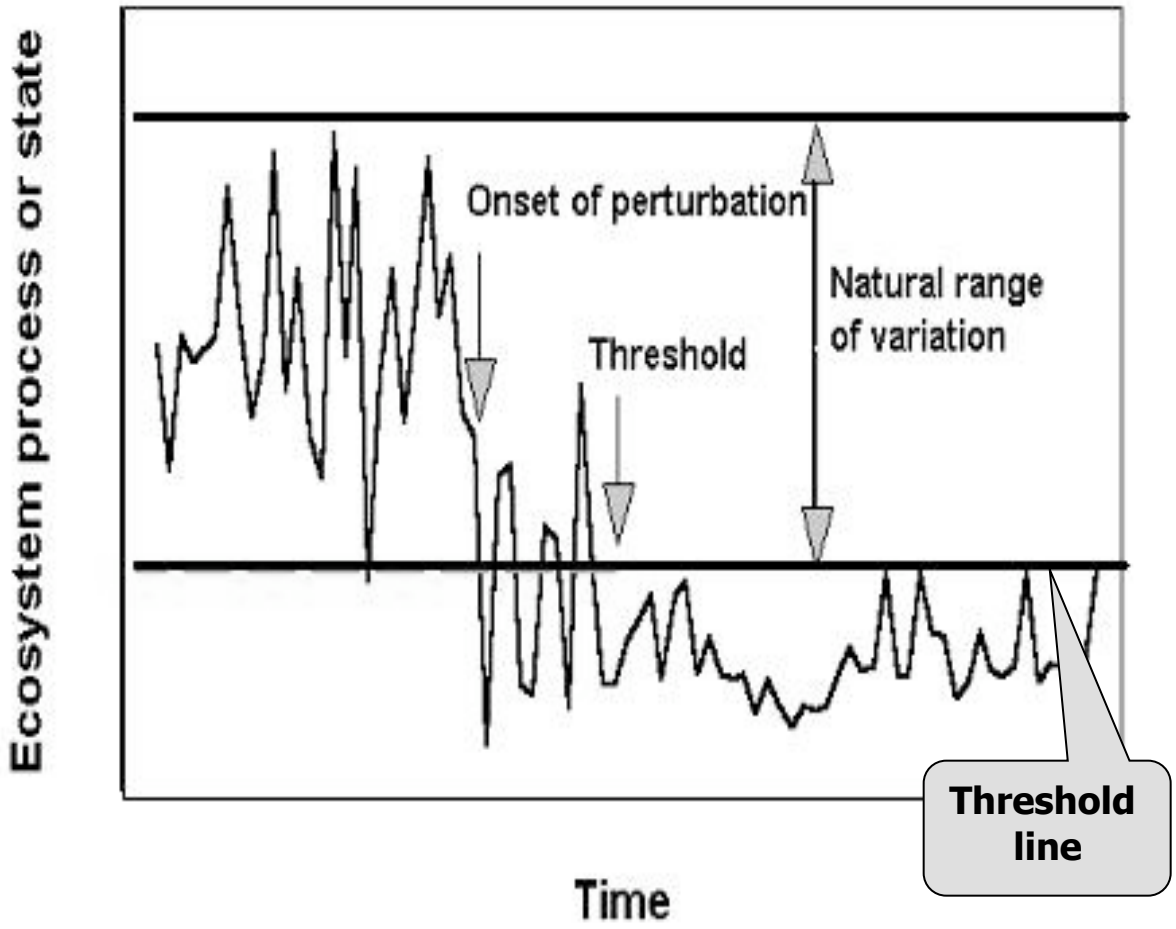
Viability Analysis: The Details

What is an “acceptable range of variation?”



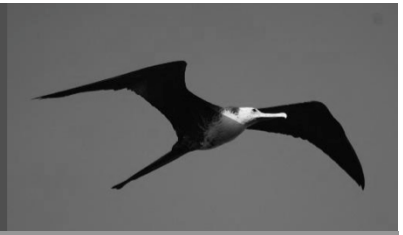
Viability Analysis: The Details

What is an "acceptable range of variation?"



- Analysis may be simple
- Or complex (e.g. PVA models for probability of persistence over specified time)
- Informed by policy

Viability Analysis: An Example



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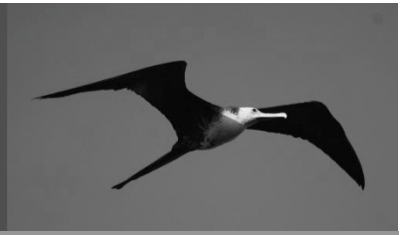
				Indicator Ratings			
Target	**Category**	**KEA**	**Indicator**	**Poor**	**Fair**	**Good**	**Very Good**
Seabirds	Size	Population size of frigatebirds	Breeding pairs of frigatebirds				

Threshold line

Viability Analysis: An Example



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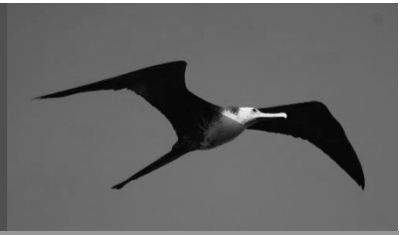
				Indicator Ratings			
Target	**Category**	**KEA**	**Indicator**	**Poor**	**Fair**	**Good**	**Very Good**
Seabirds	Size	Population size of frigatebirds	Breeding pairs of frigatebirds			501 – 1,000	

Threshold line

Viability Analysis: An Example

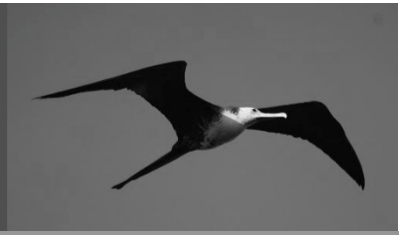


Poor:	**Fair:**	**Good:**	**Very Good:**
Restoration increasingly difficult; May result in extirpation	Outside acceptable range of variation; Requires human intervention	Indicator w/in acceptable range of variation; Some intervention required for maintenance	Ecologically desirable status; Requires little intervention for maintenance

				Indicator Ratings			
Target	**Category**	**KEA**	**Indicator**	**Poor**	**Fair**	**Good**	**Very Good**
Seabirds	Size	Population size of frigatebirds	Breeding pairs of frigatebirds		301 – 500	501 – 1,000	

Threshold line

Viability Analysis: An Example

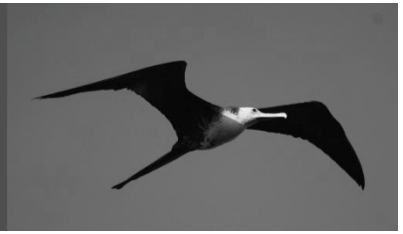


Poor:	**Fair:**	**Good:**	**Very Good:**
Restoration increasingly difficult; May result in extirpation	Outside acceptable range of variation; Requires human intervention	Indicator w/in acceptable range of variation; Some intervention required for maintenance	Ecologically desirable status; Requires little intervention for maintenance

				Indicator Ratings			
Target	**Category**	**KEA**	**Indicator**	**Poor**	**Fair**	**Good**	**Very Good**
Seabirds	Size	Population size of frigatebirds	Breeding pairs of frigatebirds	< 300	301 – 500	501 – 1,000	> 1,000

Threshold line

Viability Analysis: An Example



3) Define your current state and your desired future state for your target

				Indicator Ratings			
Target	**Category**	**KEA**	**Indicator**	**Poor**	**Fair**	**Good**	**Very Good**
Seabirds	Size	Population size of frigatebirds	Breeding pairs of frigatebirds	< 300	301 – 500	501 – 1,000	> 1,000
Current Status						550	
Desired Future Status						800	

Another Example

Poor: Restoration increasingly difficult; May result in extirpation	**Fair:** Outside acceptable range of variation; Requires human intervention	**Good:** Indicator w/in acceptable range of variation; Some intervention required for maintenance	**Very Good:** Ecologically desirable status; Requires little intervention for maintenance

Target
Seasonally flooded wetlands

Step 1B Viability Analysis More Examples

Poor:	**Fair:**	**Good:**	**Very Good:**
Restoration increasingly difficult; May result in extirpation	Outside acceptable range of variation; Requires human intervention	Indicator w/in acceptable range of variation; Some intervention required for maintenance	Ecologically desirable status; Requires little intervention for maintenance

Target	Category	KEA	Indicator
Seasonally flooded wetlands	Condition	Community architecture	Native plant species richness

Step 1B Viability Analysis More Examples

Poor:	**Fair:**	**Good:**	**Very Good:**
Restoration increasingly difficult; May result in extirpation	Outside acceptable range of variation; Requires human intervention	Indicator w/in acceptable range of variation; Some intervention required for maintenance	Ecologically desirable status; Requires little intervention for maintenance

				Indicator Ratings			
Target	Category	KEA	Indicator	Poor	Fair	Good	Very Good
Seasonally flooded wetlands	Condition	Community architecture	Native plant species richness			Mostly native vegetat-ion	Native vegetat-ion only

Step 1B Viability Analysis More Examples

Poor:	**Fair:**	**Good:**	**Very Good:**
Restoration increasingly difficult; May result in extirpation	Outside acceptable range of variation; Requires human intervention	Indicator w/in acceptable range of variation; Some intervention required for maintenance	Ecologically desirable status; Requires little intervention for maintenance

				Indicator Ratings			
Target	Category	KEA	Indicator	Poor	Fair	Good	Very Good
Seasonally flooded wetlands	Condition	Community architecture	Native plant species richness	Predom-inantly invasive exotics	Some invasives	Mostly native vegetat-ion	Native vegetat-ion only

Step 1B Viability Analysis More Examples

Poor:	**Fair:**	**Good:**	**Very Good:**
Restoration increasingly difficult; May result in extirpation	Outside acceptable range of variation; Requires human intervention	Indicator w/in acceptable range of variation; Some intervention required for maintenance	Ecologically desirable status; Requires little intervention for maintenance

				Indicator Ratings			
Target	Category	KEA	Indicator	Poor	Fair	Good	Very Good
Seasonally flooded wetlands	Condition	Community architecture	Native plant species richness	Predom-inantly invasive exotics	Some invasives	Mostly native vegetat-ion	Native vegetat-ion only
			Current Status		Some invasives		
			Desired Future Status			Mostly native	

How Do We Deal With Uncertainty?

- Viability assessments capture the current state of knowledge
- Knowledge about different focal ecosystem components will vary

How Do We Move Forward
In Spite of Different Levels of
Scientific Uncertainty?

Partnership Target Setting Process

Set Targets for a Mix of Focal Ecosystem Components and Key Threats

Step 1: For Each Focal Ecosystem Component…

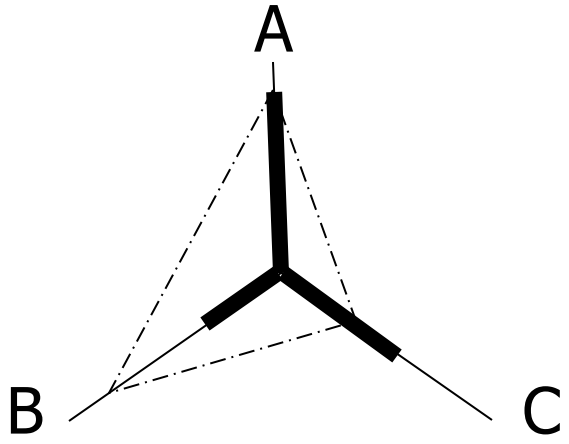
- Describe known historical condition/capacity
- Estimate or describe what would be viable or necessary for a functioning Puget Sound
- Describe current status and trends
- Inform policy options for 2020 targets

Partnership Target Setting Process

Set Targets for a Mix of Focal Ecosystem Components and Key Threats

Step 2: For Suite of Focal Ecosystem Components…

- Analyze suites of targets in ecosystem context – species and food web interactions and threat reduction objectives
- Review and revise
- Inform policy options for 2020 targets



Partnership Target Setting Process

Initial "No Regrets" Targets

- Eelgrass
- Estuary Restoration
- Shellfish Beds Reopened

Different Scientific Challenges

- Eelgrass – No estimates of historical abundance & distribution; current status based on sampling since 2000; DNR's proposed 2020 target is to have measurable increase.
- Estuary Restoration – Nearshore scientists may be able to define what is ultimately needed and use that to estimate 2020 target

Partnership Target Setting Process

Next Steps:

- Refining focal ecosystem components
- Identifying sequence and suites of ecosystem components for target setting

What Scientific Considerations Should Inform Those Choices?

Possible Roles for Target Setting

Action	PSP Staff & Teams	Science Panel	ECB	LC	xPSP PM
Identify indicator(s); define acceptable range of variation & current status	R: Work groups	A	C	I	C
Describe desired future status	R: Work groups	C	I	A	C
Analyze suites of targets based on ecosystem interactions	R: Staff & NOAA	C	C	A	C
Revise targets	R: Work groups	C	C	A	C
Identify sequence and suites for next targets	R: Staff & Work groups	C	C	I	A

R = Responsible **A** = Accountable **C** = Consulted (2-way) **I** = Informed (1-way)